Abstract Submitted
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The Effect of Pre-formed Plasmas on Relativistic Electron Acceleration[1] JAEBUM PARK, LAURENT DIVOL, HUI CHEN, SABRINA NAGEL, G. JACKSON WILLIAMS, Lawrence Livermore Natl Lab, SHAUN KERR, Univ. of Alberta, Canada — Pre-formed plasmas effects have been extensively studied and are known to affect relativistic electrons production via laser plasma interactions. However, there are still many unknowns, such as laser energy absorption vs. scale-length and material dependence. We have investigated the pre-formed plasmas effects on relativistic electrons by simultaneously measuring the plasma density with a 2w optical interferometer and relativistic electron energy distributions on the LLNL Titan laser. The pre-formed plasmas were produced on Parylene-N and Ti targets by a separate laser and/or the ASE of the short pulse (SP) laser with upper 10^{19} W/cm^2 at 1w. A 3-D wedge geometry HYDRA simulation is used to benchmark sub-critical density and infer scale-length at the critical density. Electron energy ratios of along the SP beam to the target back normal show stronger pre-formed plasmas effects on creation of relativistic electrons from Parylene-N than Ti.

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